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U.S. DEPARTMENT OF COMMERCE / National Oceanic and Atmospheric Administration

FEDERAL COORDINATOR FOR METEOROLOGICAL SERVICES AND SUPPORTING RESEARCH

National Severe Local Storms Operations Plan

FCM 77-1

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U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
FEDERAL COORDINATOR FOR METEOROLOGICAL
SERVICES AND SUPPORTING RESEARCH

NATIONAL SEVERE LOCAL STORMS OPERATIONS PLAN

Supersedes National Severe Local Storms
Operations Plan - 1976

Washington, D.C.
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FCM 77-1

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PREFACE

This is the tenth of an annual series of National Severe Local Storms Operations Plans that was developed after a 1967 request by the Federal Coordinator for Meteorological Services and Supporting Research. This plan outlines the responsibilities of the various United States agencies which provide meteorological services in observing and forecasting severe local storms.

Interdepartmental Severe Local Storms Conferences, of which there have been six, bring together cognizant Federal agencies to resolve problems of mutual concern related to the National Severe Local Storms Warning Service. Such conferences will be held every two years, if items warrant. National Weather Service Severe Local Storms Conference are held on as required basis.

This plan supersedes the 1976 version and reflects the recommendations of the 1976 National Weather Service and Interdepartmental Severe Local Storms Conferences, and the SC/BMS Working Group on Severe Local Storms.

Additional information describing the warning programs of the participating agencies can be found in Air Weather Service Manual 105-8, Weather Warnings and Specialized Forecasts; Weather Service Operations Manual Chapter C-40, Severe Local Storm Warnings; and Operations of the National Weather Service.

Edward S. Epstein
Federal Coordinator for Meteorological
Services and Supporting Research

NATIONAL SEVERE LOCAL STORMS

OPERATIONS PLAN

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RESPONSIBILITIES OF COOPERATING AGENCIES

1. National Weather Service (NWS). It shall provide:

a. Basic surface, upper air, and radar observations from its network of stations making such observations.

b. Additional observations, when required. These observations will be transmitted to any requesting agency on the appropriate teletypewriter communication circuits.

c. Basic analyses and forecast charts through the National Meteorological Center (NMC), Camp Springs, Md.

d. Severe Weather Watch Bulletins and radar facsimile charts through the Severe Local Storms (SELS) Unit and the Radar Analysis and Development Unit (RADU) of the National Severe Storms Forecast Center (NSSFC) at Kansas City, Mo.

e. Statements and warnings issued by Weather Service Forecast Offices (WSFOs) and Weather Service Offices (WSOs) throughout the United States.

f. Aviation Inflight Weather Advisories through WSFOs with aviation responsibilities for periods up to 6 hours for aircraft (civilian and military) and amendments to appropriate aviation forecasts whenever severe local storm(s) are possible or are in existence.

g. A concerted effort to collect and relay Pilot Reports (PIREPS).

h. Appropriate public educational materials concerning the severe local storms warning service and development of community preparedness plans in accordance with the Defense Civil Preparedness Agency (DCPA)/ National Oceanic and Atmospheric Administration (NOAA) Agreement on Community Disaster Preparedness.

2. The National Environmental Satellite Service (NESS). It shall:

a. Operate satellite systems capable of providing coverage of selected portions of the United States and adjoining coastal areas during the severe storms season.

b. Receive and respond to requirements for coverage of specific areas and times from the NSSFC.

c. Provide appropriate satellite data to authorized research facilities either directly or through the Environmental Data Service (EDS).

d. Be available for conferences with personnel of NSSFC and WSFOs, primarily through its Satellite Field Service Stations (SFSSs), either in person or by telephone.

e. Coordinate with the National Aeronautics and Space Administration (NASA) on providing data from its R&D satellites to NOAA operational units for their use on an as required basis.

3. U.S. Air Force (USAF). The Air Weather Service is responsible for weather warning support to USAF and U.S. Army units throughout the world. It shall provide:

a. Basic surface, upper air, and radar observations from its network of stations making such observations.

b. Additional observations, when required, making all such reports available to any requesting agency on the appropriate teletypewriter communication circuits.

c. A concerted effort to collect and relay PIREPS.

d. Through the Air Force Global Weather Central (AFGWC), Offutt Air Force Base, Nebr.:

(1) Weather warning support in the conterminous United States and 200 miles offshore to:

(a) U.S. Air Force, U.S. Army, and selected U.S. Navy installations

(b) Air National Guard and Air Force Reserve Units.

(c) Plant sites and facilities operated under Department of Defense (DOD) contracts.

(d) Airborne military aircraft when under military control.

(2) Via the USAF communications system:

(a) Military Weather Advisories for general areas in graphic form, eight times daily valid at 0300Z plus every three hours.

(b) Point Warnings in plain language, as required, whenever weather is expected to meet warning criteria. These Point Warnings are issued to about 500 locations in the conterminous United States.

(c) Summaries of severe convective weather occurrences.

(d) Further weather outlooks in plain language, twice daily, for the 12-hour period beyond the 0900Z and 2100Z advisories.

(e) A continuous meteorological watch on the possibilities of severe weather developments and of other weather phenomena for which AFGWC has warning responsibility.

4. The U.S. Navy.

The Navy does not operate a centralized Severe Local Storms Warning Service. Requirements for early warnings of hazardous flying conditions and local destructive phenomena are met by NSSFC/AFGWC products interpreted locally by Naval Weather Service Command personnel. Full use is made of information received on the National Facsimile Network (NAFAX), military, and civil weather circuits.

5. The Federal Aviation Administration (FAA). It shall provide:

a. Communication services and observations in accordance with the January 24, 1977 MEMORANDUM OF AGREEMENT between the NOAA and FAA to support the Severe Local Storms Operations Plan.

b. Dissemination/Broadcasting of Airmen's Meteorological Information (AIRMETS) and Significant Meteorological Information (SIGMETS) by Flight Service Stations (FSS) during preflight briefings and to aircraft in flight.

6. Exchange of Data Between Agencies.

a. There shall be a mutual exchange of relevant data on the part of all concerned agencies outlined in chapter 1. Because NSSFC and AFGWC are the units responsible for preparing severe weather forecasts, data concerning such forecasts will be exchanged between these units. Direct telephone communications between AFGWC and NSSFC may be made over the Federal Telecommunications Service (FTS) and Automatic Voice Network (AUTOVON) through the operators at Richards-Gebaur AFB, Mo.

b. The coordination channel for exchange of data between NSSFC and AFGWC shall be between the Commander, AFGWC, and the Director, NSSFC. Unresolved differences will be referred to the Public Services Branch, Meteorological Services Division, National Weather Service Headquarters, and to the Headquarters, Air Weather Service.

c. At the present time, the National Weather Service, National Environmental Satellite Service, Environmental Research Laboratories' National Severe Storms Laboratory (NSSL), and the Air Weather Service are actively engaged in developing objective severe weather forecasting and analysis techniques. These organizations will engage, whenever possible, in a joint technique development program and will exchange any objective techniques developed.

7. Requests for Special Observations.

Any special rawinsonde or pilot balloon (PIBAL) observations needed during the continuous weather monitoring underway at NSSFC and at AFGWC are authorized and will be requested when needed.

When special upper air network soundings are required, they should normally be made at 0600Z or 1800Z. The Director, NSSFC, will initiate the request to the National Weather Service and National Aeronautics and Space Administration (NASA) stations, and the Commander, AFGWC, will similarly request soundings from DOD stations. Although WSFOs have the authority to request special upper air observations during periods of potentially severe storms of all types, requests for special soundings during periods of potentially severe local storms should be made by SELS. Any cost involved in these special soundings will be borne by the agency making the sounding.

Air Weather Service requests for National Weather Service or NASA soundings should be made to the duty forecaster at NSSFC. National Weather Service requests for USAF soundings should be made to the AFGWC duty officer (FTS 221-3612 or 294-2586).

NSSFC may also request special limited scan GOES data on critical severe storm days.

8. Backup Plan for SELS.

In the event that NSSFC (SELS) should be incapacitated or otherwise unable to discharge its severe weather forecasting functions, the AFGWC will provide backup for SELS. In the event of a power outage or other major disruption of operations, the SELS forecaster will make telephone contact with the designated AFGWC focal point and request backup. The SELS forecaster will also provide AFGWC with an estimate of the duration of the outage as well as subsequent updated information when available. The number of the last valid watch will also be provided.

Upon notification from SELS that the Backup Plan is to be implemented, AFGWC will prepare and transmit watches, outlooks and other advices regarding severe local storm activity as prescribed in Weather Service Operations Manual (WSOM) Chapter C-40. In addition, AFGWC will, as soon as practical, prepare and transmit NSSFC graphic NAFAX and NAMFAX products (radar summary charts and the severe weather outlook graphic). The AFGWC will initiate a suitably worded message for RAWARC indicating that emergency backup procedures are in effect and that subsequent severe weather watches, etc., will be issued by AFGWC as required.

Part A of all AFGWC backup watches will begin as follows: "THE USAF AIR WEATHER SERVICE ACTING IN A BACKUP CAPACITY FOR THE NATIONAL WEATHER SERVICE SAYS THERE IS A POSSIBILITY . . . " Prior to issuance or cancellation of a watch, AFGWC will coordinate by telephone with the affected WSFOs if time permits. AFGWC will transmit backup material on RAWARC (via the Air Force Automatic Digital Weather Switch) and on NAFAX directly.

When SELS resumes normal operation, a message to this effect will be placed on RAWARC by SELS.

9. Notification of Military Installations.

The NWS will notify selected military installations when severe convective weather is expected to affect such sites and the installation's AWS detachment is not manned by a forecaster or the station's radar is inoperative. The notification will be performed by selected NWS offices using radar and/or other information available. Notifications will be according to "alerting agreements" between the AWS/NWS offices concerned. Such written agreements are initiated by the AWS units, but require approval of AWS and NWS Headquarters before they can go into effect.

The service to be provided is a wakeup/alerting service to cover severe convective weather occurrences with short lead times, i.e., those developments that the AWS' normal alerting system may miss. No other service will normally be required. As appropriate, radar data may be exchanged. Severe convective weather is defined as thunderstorms with winds 50 knots or more, hail 3/4-inch in diameter or larger, and/or tornadoes.

Notification will be made to only one telephone number. Only one call will be made; however, if the line is busy, one additional call will be made. The notification will be made after the mass news media and civil defense authorities have been notified according to NWS' present warning dissemination procedures and priorities. The agreement will specify the hours during which the alerting service is to be provided.

9.1 Military/NWS Locations Involved.

Agreements for providing the alerting service have been signed between the following locations. Changes may be made to this list at any time.

Military Location	NWS Office
Beale AFB	WSO Sacramento, CA
Bergstrom AFB	WSO Austin, TX
Buckley AFB	WSFO Denver, CO
Cannon AFB	WSO Amarillo, TX
Columbus AFB	WSFO Jackson, MS
Craig AFB	WSO Montgomery, AL
Dobbins AFB	WSO Athens, GA
Dyess AFB	WSO Abilene, TX
Edwards AFB	WSO Palmdale, CA
Eglin AFB	WSO Pensacola, FL
Ft. Campbell	WSO Nashville, TN
Ft. Carson	WSO Colorado Springs, CO
Ft. Hood	WSO Waco, TX
Ft. Knox	WSO Louisville, KY
Ft. Leonard Wood	WSO Springfield, MO
Ft. Riley	WSFO Topeka, KS
Ft. Stewart	WSO Savannah, GA
George AFB	WSO Palmdale, CA
Holloman AFB	WSO El Paso, TX
Homestead AFB	NHC Miami, FL

Military Location (Cont'd)	NWS Office (Cont'd)
Keesler AFB	WSO Mobile, AL
Kelly AFB	WSFO San Antonio, TX
Kirtland AFB	WSFO Albuquerque, NM
Laughlin AFB	WSO Del Rio, TX
Little Rock AFB	WSFO Little Rock, AR
Maxwell AFB	WSO Montgomery, AL
McClellan AFB	WSO Sacramento, CA
McGuire AFB	WSO Atlantic City, NJ
Moody AFB	WSO Macon, GA
Myrtle Beach AFB	WSO Charleston, SC
Nellis AFB	WSO Las Vegas, NV
Pease AFB	WSO Concord, NH
Peterson Field	WSO Colorado Springs, CO
Randolph AFB	WSFO San Antonio, TX
Reese AFB	WSFO Lubbock, TX
Richards-Gebaur AFB	NSSFC Kansas City, MO
Robins AFB	WSO Macon, GA
Scott AFB	WSFO St. Louis, MO
Selfridge AFB	WSFO Detroit, MI
Shaw AFB	WSO Charleston, SC
Sheppard AFB	WSO Wichita Falls, TX
Tinker AFB	WSFO Oklahoma City, OK
Tyndall AFB	WSO Pensacola, FL
Vance AFB	WSFO Oklahoma City, OK
Webb AFB	WSO Midland, TX
Whiteman AFB	NSSFC Kansas City, MO

DEFINITIONS

This chapter defines those common meteorological terms, subject to multiple interpretations, which are used by agencies preparing severe local storms forecasts and warnings.

1. Funnel Cloud. A rotating column of air forming a pendant from a cumulus or cumulonimbus cloud, whose circulation does not reach the ground.

2. Severe Local Storms. Dangerous storms that usually cover relatively small geographical areas or move in narrow paths and are of sufficient intensity to threaten life and property. For the purpose of this plan, a severe local storm is a tornado, funnel cloud, waterspout, or a thunderstorm with winds of 50 knots or greater and/or hail 3/4-inch in diameter or greater at the surface. Wind damage may be used to infer the occurrence/existence of a severe local storm.

3. Severe Local Storms Season. Although the center of maximum frequency shifts during the year, tornadoes and severe thunderstorms may occur anywhere in the United States at anytime during the year. The months of greatest total frequency are April, May, and June.

4. Squall Line. A line of active thunderstorms or squalls which may extend over several hundred miles. It is the phenomenon of the mature or active stage of "instability-line" development and may be either a solid or broken line of thunderstorms.

5. Density of Severe Thunderstorms: The following adjectives describe the possible density of severe thunderstorms in a severe weather watch or outlook area.

a. Isolated--an extremely small number are expected.

b. Few--up to 15 percent coverage.

c. Scattered--16 to 45 percent coverage.

d. Numerous--more than 45 percent coverage.

e. MIC (Maximum Instantaneous Coverage)--the percentage of the area that will be covered by cumulonimbus cells at the time of maximum activity. (Military Weather Advisories only.)

f. TAA (Total Area Affected)--the percentage of the area that will experience one or more thunderstorms during the applicable valid period. (Military Weather Advisories only.)

Adjectives such as the above will not be used to indicate the possible density of tornadoes. The Tornado Watch Bulletin will only state that the threat of tornadoes exists in the designated watch area.

6. Thunderstorm Intensity Categories. Only the following thunderstorm intensity classes will be used in the forecasting and warning functions of concerned agencies.

a. Thunderstorm--Wind gusts less than 50 knots and hail, if any, of less than 3/4-inch diameter at the surface.

b. Severe Thunderstorm--Wind gusts of 50 knots or greater or hail of diameter 3/4-inch or greater at the surface. Wind damage may be used to infer the occurrence/existence of a severe thunderstorm.

7. Tornado. A violent, rotating column of air usually forming a pendant from a cumulonimbus cloud, whose circulation reaches the ground. It nearly always starts as a funnel cloud and is accompanied by a loud roaring noise. On a local scale, it is the most destructive of all atmospheric phenomena.

8. Waterspout. A rotating column of air usually pendant from a cumulus or cumulonimbus cloud which forms over a body of water and whose circulation touches the water.

FORECASTS AND WARNINGS

1. General. Although every effort has been made to standardize terminology, adopt common definitions, and adjust criteria to a common base, each agency has differing operational warning criteria that must be met. Although standardization will be used wherever possible in forecasts and warnings, each agency retains the right to specify the forecast and warning criteria that are needed to carry out the mission of its service.

2. Other Warning Criteria. All phenomena (other than those classified as severe storms, Chapter 2, Item 2) described in the various warnings, bulletins, and advisories should be categorized as "other warning criteria" and are not called severe weather phenomena. Such other warning criteria will be listed separately in appropriate National Oceanic and Atmospheric Administration (NOAA)/National Weather Service and U.S. Air Force (USAF)/ Air Weather Service publications.

3. National Weather Service Watch/Warning Procedures.

3.1 General. The National Weather Service has statutory responsibility for providing a Severe Local Storms Warning Service for all 50 states. NSSFC does not issue watches for Alaska or Hawaii. Instead the WSFOs at Anchorage and Honolulu have the responsibility for maintaining weather watches and issuing warnings as needed for their respective states. Procedures described in this plan are followed to the extent that they are applicable.

This Warning Service is available to the general public and to general and commercial aviation and is provided through the National Severe Storms Forecast Center (NSSFC) at Kansas City, the National Meteorological Center (NMC) at Camp Springs, Maryland, Weather Service Forecast Offices (WSFOs), and Weather Service Offices (WSOs).

3.2 Watch/Warning Criteria. Events for which aviation and public severe weather watch and warning bulletins may be issued are the same. Any or all of the categories listed below may be mentioned in such bulletins to indicate more fully the severe weather possible/occurring.

a. Severe Thunderstorm:

(1) Wind--thunderstorm related surface winds (sustained or gusts) of 50 knots or greater;

(2) Hail--surface hail 3/4-inch or larger. The word hail in a watch bulletin implies hail at the surface as well as aloft unless a qualifying phrase such as "hail aloft" is used.

b. Tornado:

(1) Severe weather watches/warnings that mention tornadoes imply that thunderstorm activity, usually severe, is also expected/occurring. Severe weather watches will not refer to funnel clouds.

3.3 NMC. NMC is the central data processing center for the NWS. NMC issues prognostic charts, discussions, and other forecast materials.

3.4 NSSFC. NSSFC, through its SELS unit, is responsible for issuing and cancelling severe local storm watches and for preparing other appropriate material essential to the Severe Local Storms Warning Service.

a. Combined Public and Aviation Watch Bulletins. Although a warning service is provided for public and aviation interests, separate watches are not issued for these interests but are combined into one bulletin. Each combined watch bulletin (see example page 11) contains information for the general public (sections A and B) and aviation interests in discrete, alphabetical, sequential sections. When a section is not applicable, it will be omitted. The text will begin with the most serious type of severe weather expected--"Tornado Watch" or "Severe Thunderstorm Watch." The location of the area affected and the valid period of the watch which are common to both public and aviation sections are given in Section A. Combined watches are numbered serially beginning with number 1 for the first issuance of each calendar year. SELS will issue an unnumbered watch cancellation message whenever it cancels a watch.

b. Aviation Tornado Watch (WW). SELS will issue aviation tornado watches only for tropical cyclone-related tornadoes, and will number the watch by appending a letter to the last assigned combined watch number (ex: 404A, 404B, etc.). Statute miles will be used; time will be GMT.

c. RADU. The Radar Analysis and Development Unit (RADU) of NSSFC prepares hourly Radar Summary Charts, 16 of which are transmitted on the National Weather Facsimile Circuit (NAFAX). Some Radar Summary Charts are also transmitted on the National and Aviation Meteorological Facsimile Circuit (NAMFAX). The RADU will use all available radar data except in extremely heavy workload situations. In this case, the areas of minimum significance will be omitted and so indicated on the Radar Facsimile Chart. The National Weather Service uses the radar composite charts prepared by its radar unit at the Salt Lake City, Utah, Air Route Traffic Control Center (ARTCC), as the western portion of these charts.

BULLETIN - IMMEDIATE BROADCAST REQUESTED
TORNADO WATCH NUMBER 104
NATIONAL WEATHER SERVICE KANSAS CITY MO
143 PM CDT THU APR 17 1975

A...THE NATIONAL SEVERE STORMS FORECAST CENTER SAYS THERE IS A POSSIBILITY OF TORNADOES AND SEVERE THUNDERSTORMS WITH LARGE HAIL AND DAMAGING WINDS FOR
THE SOUTHEASTERN HALF OF MISSOURI
NORTHWEST ARKANSAS
EXTREME NORTHEASTERN OKLAHOMA
AND A SMALL PART OF SOUTHWESTERN ILLINOIS
FROM 2 PM CDT UNTIL 8 PM THIS THURSDAY AFTERNOON AND EVENING.

THE WATCH AREA IS ALONG AND 70 STATUTE MILES EITHER SIDE OF A LINE FROM 10 STATUTE MILES NORTH OF ST. LOUIS MISSOURI TO 20 STATUTE MILES WEST OF FORT SMITH ARKANSAS.

REMEMBER...A TORNADO WATCH MEANS THAT TORNADOES AND SEVERE THUNDERSTORMS ARE POSSIBLE IN AND CLOSE TO THE WATCH AREA. PERSONS IN THESE AREAS SHOULD BE ON THE LOOKOUT FOR THREATENING WEATHER CONDITIONS AND LISTEN FOR LATER STATEMENTS AND POSSIBLE WARNINGS.

B...THIS TORNADO WATCH REPLACES TORNADO WATCH NUMBER 101 ISSUED AT 945 AM CDT... WATCH NUMBER 101 WILL NOT BE IN EFFECT AFTER 2 PM CDT.

C...TORNADOES AND NMRS SVR TSTMS WITH HAIL SFC AND ALF TO 2 IN...EXTRM TURBC AND SFC WIND GUSTS TO 70 KT...NMRS CBS WITH MAX TOPS TO 600. MEAN WIND VECTOR 23050.

D...INSTBY LN NOW FM NERN MO TO NERN OK MOVG SE 35 KT. STG MSTR CNVGNC AND PRESS FALLS AHD OF LN.

E...UPDATE AC TO INCL TSTMS IN SRN FL THIS AFTN.

GALWAY

EXAMPLE OF COMBINED SEVERE WEATHER WATCH BULLETIN.

BULLETIN
AVIATION TORNADO WATCH NUMBER 290A
NATIONAL WEATHER SERVICE KANSAS CITY MO
1130Z FRI AUG 17 1972

20 STATUTE MILES S

A...ALG AND 90 STATUTE MILES EITHER SIDE OF A LN FM 90 STATUTE MILES NNE ORL TO // DHN. THIS INCLS MOST OF NWRN FL...AND PTNS SERN AL AND SRN GA...VALID 171200Z-171800Z.

B...CONT WW 288A UNTIL EXPIRATION AT 12Z.

C...TORNADOES AND FEW SVR TSTMS...WITH HAIL ALF TO 1 1/2 IN...EXTRM TURBC AND SFC WND GUSTS EXCEEDING 65 KT...A FEW CBS WITH MAX TOPS TO 500. MEAN WIND VECTOR 20040.

D...TORNADOES AND SVR TSTMS ASSOCD WITH HURCN AGNES.

MAGOR

EXAMPLE OF AVIATION SEVERE WEATHER WATCH BULLETIN.

d. Other SELS Guidance Material. SELS also issues Severe Weather Outlook Narratives, a Severe Weather Outlook Graphic, Status Reports on Weather Watches, and Advance Information on forthcoming Watch areas (WIBIS).

3.5 Weather Service Forecast Offices (WSFOs)/Weather Service Offices (WSOs)*

a. WSFOs and WSOs release only information contained in sections A and B of the watch to the public. However, to help the public visualize which areas are affected by the watch, designated offices prepare a redefining statement (areal outline) for that part of its state within each public severe weather watch.

b. Warning responsibility for the general public is vested in WSOs. Severe weather warnings will be issued immediately by the appropriate WSO based on reports of actual or suspected severe weather in or near an Office's area of responsibility. Each warning will be identified as either a Tornado Warning or a Severe Thunderstorm Warning. When radar evidence is sufficient in the judgment of the responsible official to identify a dangerous storm, warnings based on these data will be issued immediately.

c. Offices may issue statements to keep the public informed of weather developments.

d. WSFOs with aviation responsibilities (FA Centers) issue SIGMETS (Significant Meteorological Information bulletins) whenever severe weather is forecast (i.e., SELS watch) or is reported/occurring. FA Centers advise Air Route Traffic Control Centers (ARTCC) of any SIGMETS they issue which affect the respective ARTCC areas. Appropriate reference is also made to possible severe weather in scheduled and amended public and aviation forecasts, Pilots Automatic Telephone Weather Answering Service (PATWAS), and Transcribed Weather Broadcast (TWEB) scripts.

Criteria for the issuance of SIGMETS associated with severe local storms include:

a. Tornadoes.

b. Lines of thunderstorms (squall lines).

c. Embedded thunderstorms.

d. Hail of 3/4-inch or greater in diameter.

e. Severe or extreme turbulence.

f. Severe icing.

*WSOs in this paragraph refer to both WSOs and WSFOs with county warning responsibility.

3.6 Satellite Field Service Stations (SFSSs). The SFSSs receive and analyze satellite pictures in near real time and assist NSSFC, WSFOs, and WSOs in applying these data to their severe storm forecasting and warning programs.

4. U.S. Air Force (USAF) Warning Procedures

a. General. The Air Force Global Weather Central (AFGWC) provides, by means of USAF communications system, warnings for Military installations for:

(1) Tornadoes.

(2) Thunderstorms.

(3) Strong surface winds of 35 knots or more that are not associated with thunderstorms.

(4) Heavy rain or snow (2 inches or more in a 12-hour period).

(5) Freezing precipitation.

The criteria for severe thunderstorm warnings are the same as those of the NWS.

b. Military Weather Advisories. AFGWC issues both graphic (figure 3-1) and Teletypewriter (figure 3-2) Military Weather Advisories eight times daily, valid 0300Z plus every three hours. Advisories with a valid time of 0300Z plus every six hours cover a 12-hour period while those with a valid time 0600Z plus every six hours cover a nine-hour period. Each advisory gives the area where any of the weather elements listed in Table 3-1 are expected to occur during the valid period.

(1) Purpose and Use. The Military Weather Advisories are designed to provide basic guidance to both the field forecaster, and to the point warning forecasters at AFGWC. These Advisories are issued at fixed times; preparation time is limited by data availability and presentation format. Advisories may cover fairly large areas as in the case of thunderstorms, snow, and strong gradient winds, but the areas of more severe weather--such as tornadoes and severe thunderstorms--are usually more limited in time and space.

(2) Amendment. Advisories are amended whenever the elements describe change, or are expected to change, by one category or more and whenever area boundaries change, or are expected to change, by 60 miles or more.

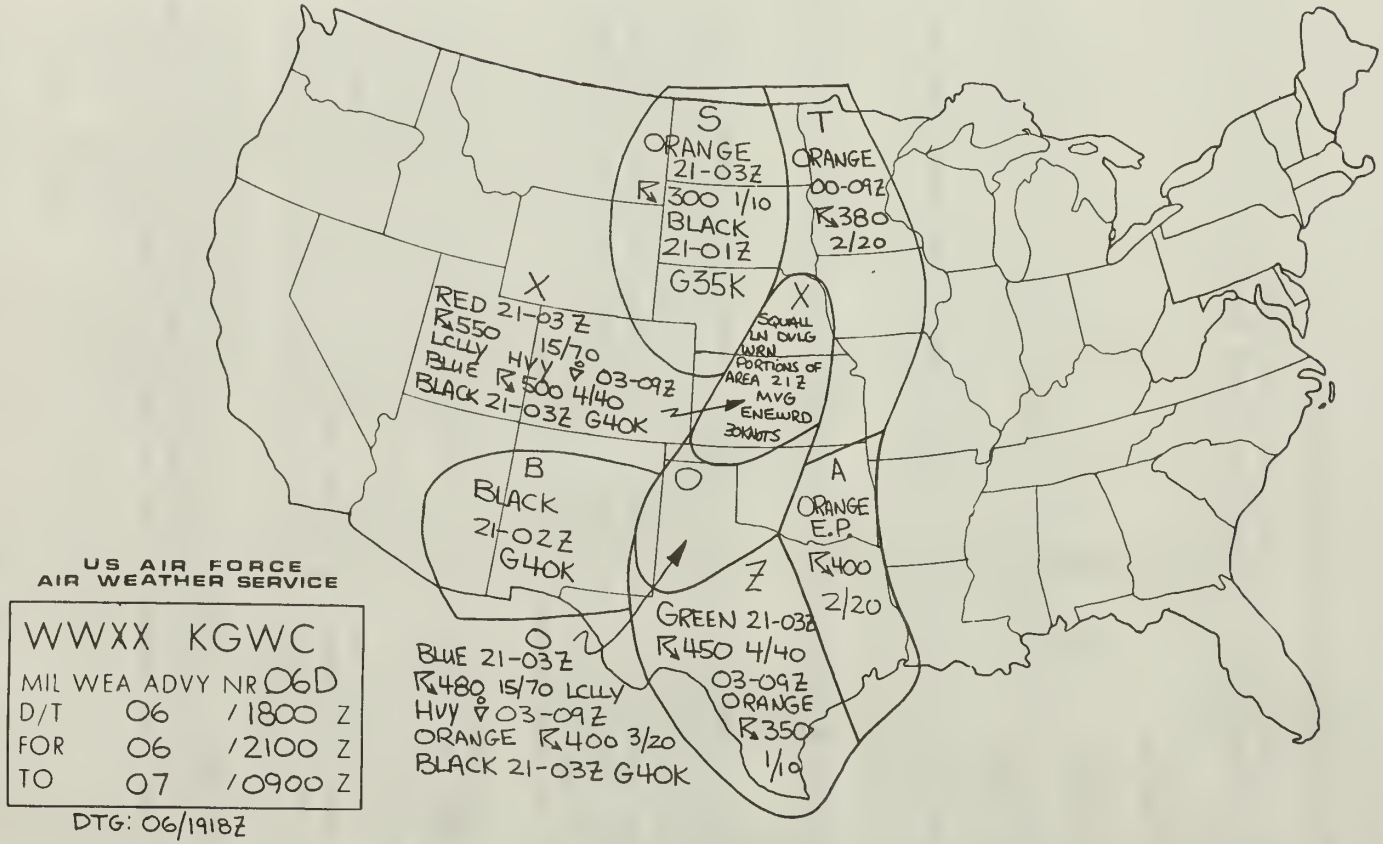


Figure 3-1.

EXAMPLE OF DESCRIPTION PORTION OF A MILITARY WEATHER ADVISORY.

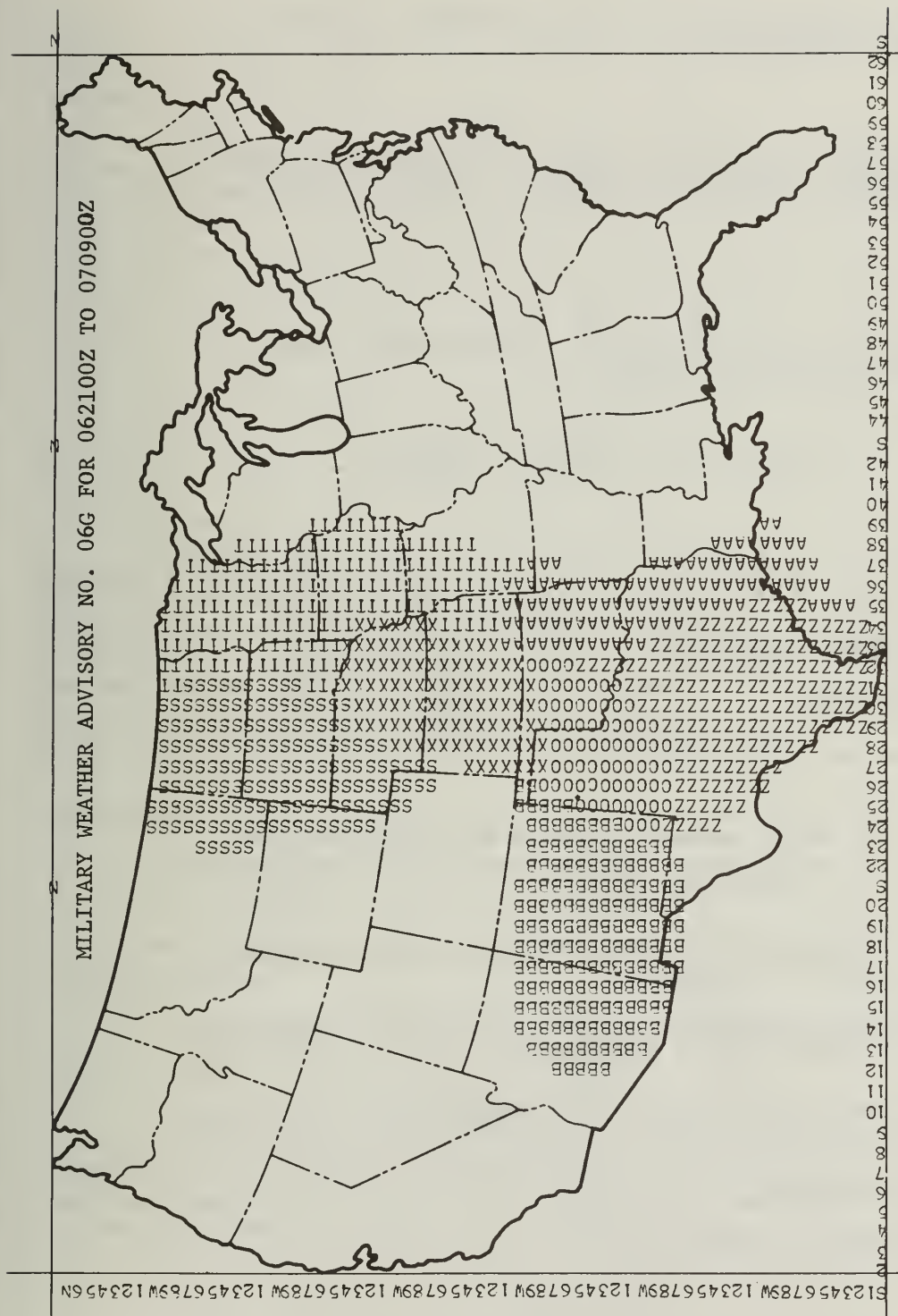


Figure 3-2.

EXAMPLE OF GRAPHIC PORTION OF MILITARY WEATHER ADVISORY.

Ø Ø32Ø1ØZ
WWXX WWXX WWXX 3 KGWC Ø32Ø1ØZ
TX 18-19

THUNDERSTORMS WITH 1 1/2 INCH HAIL AND SW GUSTS TO 65 KNOTS VALID Ø322ØØZ to Ø4Ø2ØØZ TORNADO VALID Ø322ØØZ TO Ø4Ø1ØØZ //26/12/3//

OK 7-8

THUNDERSTORMS WITH NO HAIL AND SW GUSTS TO LESS THAN 35 KNOTS EXPECTED BETWEEN Ø319ØØZ and Ø4Ø3ØØZ.

EXAMPLE OF MILITARY POINT WARNING.

Color	Weather element(s)
RED	Tornado
BLUE	Severe Thunderstorm
GREEN	Moderate Thunderstorm • winds between 35 and 49 knots inclusive, or • hail greater than or equal to 1/2" but less than 3/4" in diameter
ORANGE	Thunderstorm with winds less than 35 knots and hail less than 1/2" in diameter
BLACK	Surface winds greater than or equal to 35 knots not associated with a thunderstorm
PURPLE	Heavy rains greater than or equal to 2"
HATCHED PURPLE	Heavy snow
BROWN	Freezing precipitation

Table 3-1.

MILITARY WEATHER ADVISORY WEATHER ELEMENTS.

(3) Geographical Interpretation. A clear plastic overlay containing a scaled outline of the conterminous States, placed on the teletypewriter message containing the Military Weather Advisory, will provide geographical orientation.

c. AFGWC Point Warnings. AFGWC Point Warnings are issued in plain language (see example page 16) for the same phenomena as Advisories. While Advisories provide general guidance to all military forecasters in terms of large- and intermediate-scale synoptic developments, AFGWC Point Warnings are issued for and to specific locations in the smallest scale of space and time consistent with the availability of data and the state of the art. An effort is made to tailor the size of the points to the requirements of the using agency. The locations for which AFGWC has warning responsibility are listed in Volume II, Air Weather Service Manual 105-2. Some of the locations include two, three, or four installations in one locality; the total number of installations is approximately 500. Approximately 50 percent of these locations are U.S. Air Force, 45 percent are U.S. Army, and 5 percent are U.S. Navy. In addition to active military installations, AFGWC Point Warnings are issued for National Guard units, arsenals, ammunition plants, and other civilian activities under contract to the Department of Defense (DOD). AFGWC Point Warnings are issued for specific locations as the situation warrants in contrast to Advisories which are issued at scheduled intervals for fixed valid periods. AFGWC Point Warnings can be amended, extended, or cancelled as necessary. Probabilities of occurrences will be appended for green, blue, and red weather elements (given as a pure number separated by a solidus and enclosed in double solidi) as well as non-convective weather elements (given as a single probability enclosed by double solidi).

AFGWC Point Weather Warnings:

(1) Provide specific warning to an installation where a forecast unit is not assigned.

(2) Alert a responsible individual at locations with a limited forecast service.

(3) Alert and guide the field forecaster who has final responsibility for warning the agency he supports.

d. Local AWS Unit Point Warnings. At those locations where an Air Weather Service (AWS) forecaster is on duty, the forecaster has final responsibility for warning those agencies being supported. The criteria and lead time for such local point warnings are established locally based on customer needs.

5. Distribution of Watches, Warnings, and Severe Weather Reports by Flight Service Stations (FSSs)

This Plan does not provide for the distribution of severe weather information by FSSs. However, these Stations occasionally receive requests for such information or are given a severe weather report by an observer. Such information or requests will be referred to the WSO having warning responsibility for the county in which the requester or phenomenon is located. Weather Services Operations Manual (WSOM) C-47 lists the WSOs and their warning responsibility areas. The Federal Aviation Administration (FAA) and National Weather Service will develop the communication methods for assuring that these requests and reports reach the appropriate WSO.

COMMUNICATIONS

1. National Weather Service Systems

a. RAREP (Radar Report) and Warning Coordination (RAWARC). The National Weather Service internal teletypewriter system is a landline teletypewriter network consisting of five circuits, which terminates at the National Severe Storms Forecast Center (NSSFC) in Kansas City, the network monitoring office. Traffic on RAWARC is basically unscheduled and is handled according to a priority system, with severe weather information having the highest priority. Relays between RAWARC circuits are made by computer, with severe thunderstorm; tornado and flash flood warnings having the highest priority. Such messages break and supersede all transmissions other than similar warning messages. The only regularly scheduled material entered on RAWARC is an hourly collection (H+35) of radar reports (SD). Special radar reports and other material can be transmitted at any time the circuits are not in use.

b. NOAA Weather Wire Service (NWWS). The NWWS consists of local loops serving metropolitan areas, Statewide intrastate circuits, and overlay circuits. The purpose of NWWS is to transmit consumer-oriented forecasts, watches, weather warnings, and meteorological data to the mass news media for broadcast to the public. Various specialized users also obtain drops on NWWS to meet their requirements.

Each intrastate circuit has one Weather Service Forecast Office (WSFO) designated as the State Relay Center (SRC). The SRC is connected to the regional overlay interstate circuit and serves as the State relay point for transmissions over this regional circuit to other States through their SRCs. Washington, D.C., is the Overlay Relay Center and is responsible for relaying traffic between regional overlay circuits.

Only WSOs (or certain other authorized offices) have direct entry on these circuits. The Weather Service Forecast Offices (WSFO) furnish broad-scale information and local WSOs enter local information. Relays between adjacent circuits are established as necessary to meet the requirements of the National Weather Service's Severe Local Storms Warning Service and of subscribers located along State or area borders. When urgent material such as a warning is transmitted, a prearranged bell signal is used to attract the attention of users to the transmission.

c. National Warning System (NAWAS). This is the Defense Civil Preparedness Agency (DCPA)-operated hot line interstate telephone system which connects DCPA Warning Points, WSFOs, WSOs, and WSMOs (Weather Service Meteorological Observatory) within each State and between States. Figure 4-1 gives the location of DCPA warning points.

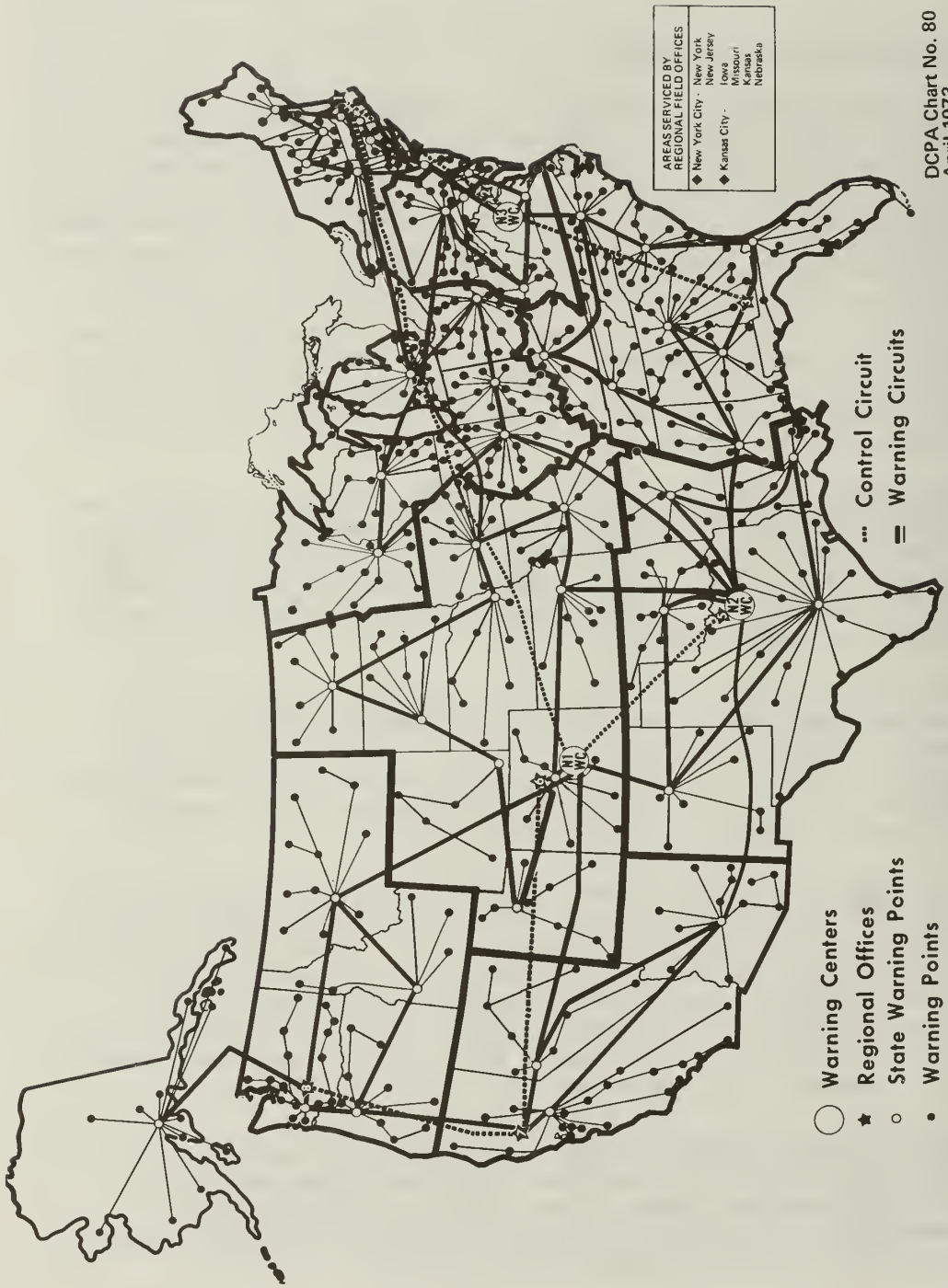


Figure 4-1.

DEFENSE CIVIL PREPAREDNESS AGENCY
NATIONAL WARNING SYSTEM

d. Emergency Action Notification Signal (EANS). Although all standard, FM and television broadcast stations may, at their discretion, use the EANS for short-fused warnings, only a few use it. Where its use is acceptable, EANS should be requested for all tornado warnings. Since EANS use is at the discretion of the individual stations, arrangements for its use are made prior to the severe local storm season, unless such use is a continuing agreement. In those areas where it is not an acceptable procedure, all tornado warnings carry the notation "Immediate Broadcast Requested." EANS is not normally requested for severe thunderstorm warnings.

e. NOAA Weather Radio. The WSOs/WSFOs equipped with NOAA Weather Radio can transmit continous weather warnings on one of three assigned frequencies between 162.40 MHz and 162.55 MHz. These radio transmitters provide continuous weather information to an area of about 40-mile radius. Local radio and TV stations can copy and rebroadcast the material even though land lines in the area may be disrupted. These transmitters have a tone signal capability which can be used to activate specially designed muted receivers.

f. Miscellaneous. Other types of distribution methods are used, as appropriate, to make warnings available to other WSOs/WSFOs and to the public as rapidly as possible.

g. Distribution of Severe Weather Watch and Warning Bulletins. The distribution of Public Severe Weather Watch and Warning Bulletins is shown in figure 4-2. The distribution of Aviation Severe Weather Watch Bulletins and In-Flight Weather Advisories is outlined in figure 4-3.

2. U.S. Air Force (USAF) Systems

a. Within the conterminous United States, USAF radar weather observations are collected by means of the Continental U.S. Meteorological Data System (COMEDS). Collected reports are transmitted from the Carswell Automatic Digital Weather Switch (CADWS) to the Air Force Global Weather Central (AFGWC), the FAA Weather Message Switching Center (WMSC), and to the National Meteorological Center (NMC) through computer-to-computer links; severe radar reports are available to NSSFC/Radar Analysis and Development Unit (RADU) in the bulletin WOUSI KAWN and the routine radar reports transmitted from WMSC to NSSFC.

b. The COMEDS is divided into nineteen geographic areas, with a single collecting and disseminating circuit covering each area (fig. 4-4).

c. The COMEDS is used to disseminate all Military Weather Advisories and Point Warnings issued by AFGWC.

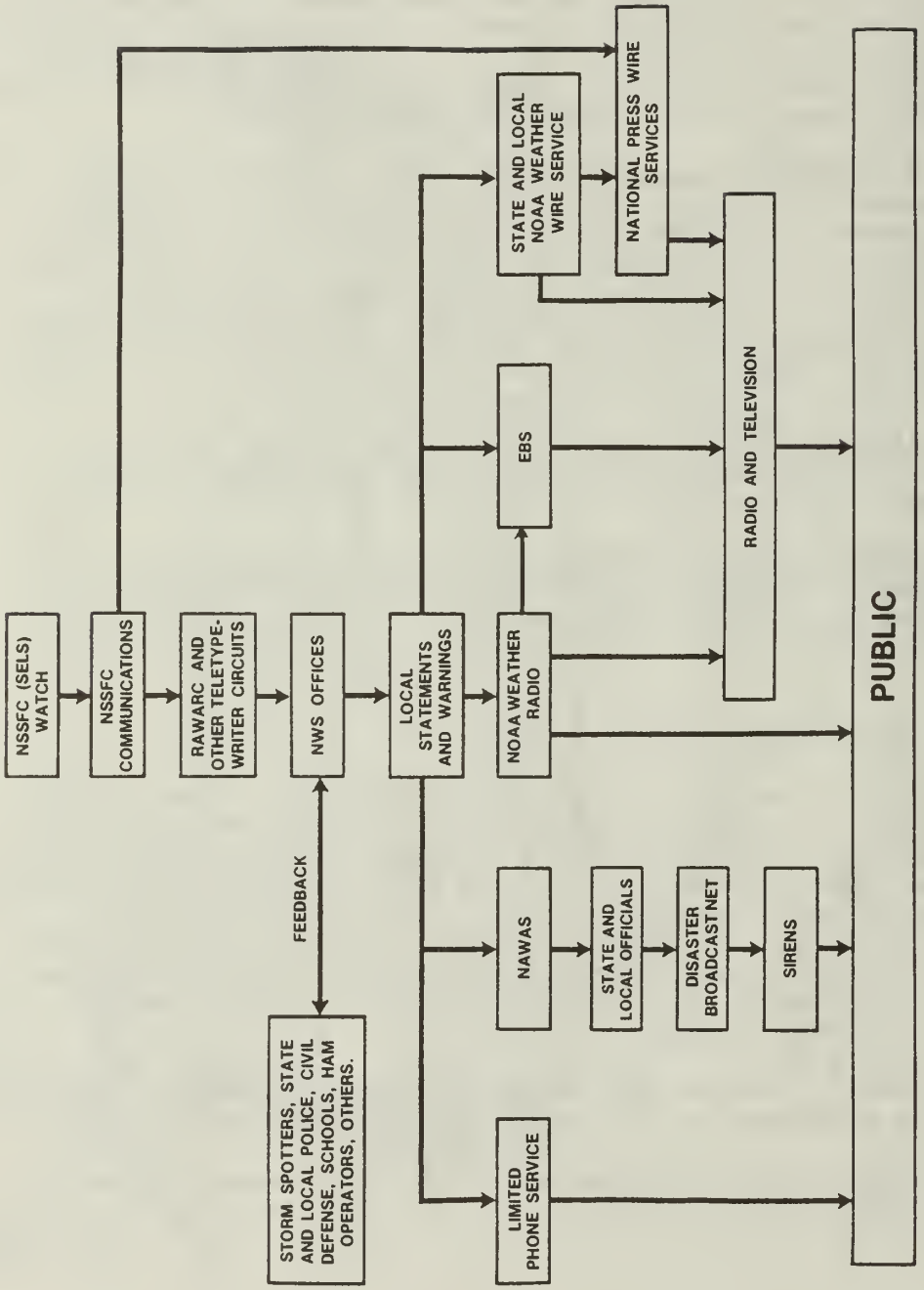


Figure 4-2. Distribution of Combined Severe Weather Watch and Warning Bulletins.

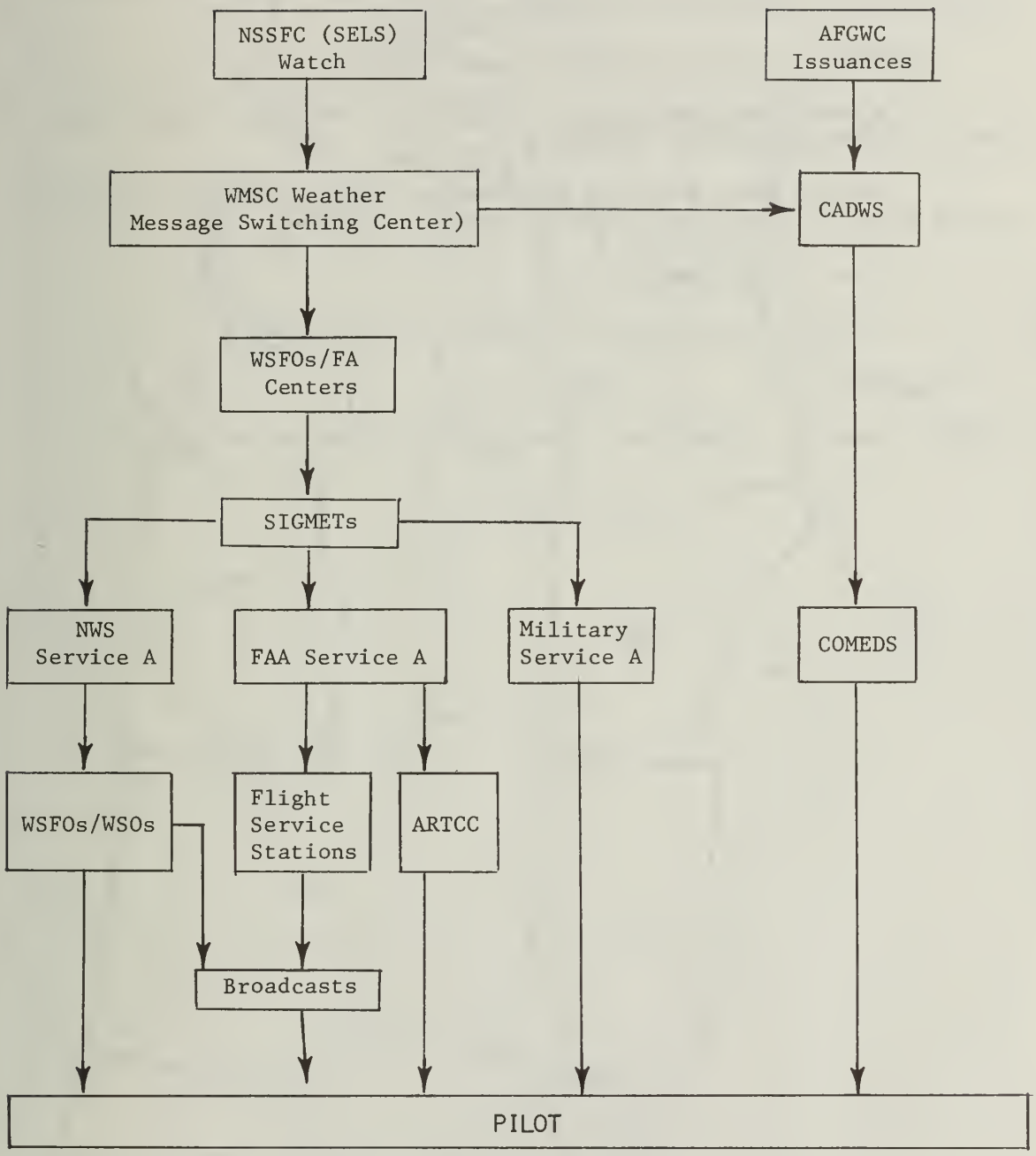


Figure 4-3

DISTRIBUTION OF AVIATION SEVERE WEATHER FORECASTS

3. Federal Aviation Administration (FAA) Systems

Service A will be used for the collection and distribution of severe local storms information as follows:

a. Hourly and Special Airway Observations.

b. Airmen's Meteorological Information (AIRMETS) and Significant Meteorological Information (SIGMETS).

c. Hourly Radar Summaries from National Weather Service radar units at Air Route Traffic Control Centers (ARTCC).

d. Hourly Radar Reports.

e. PIREPS

4. U.S. Navy

COMEDS is used to collect and disseminate U.S. Navy weather reports.

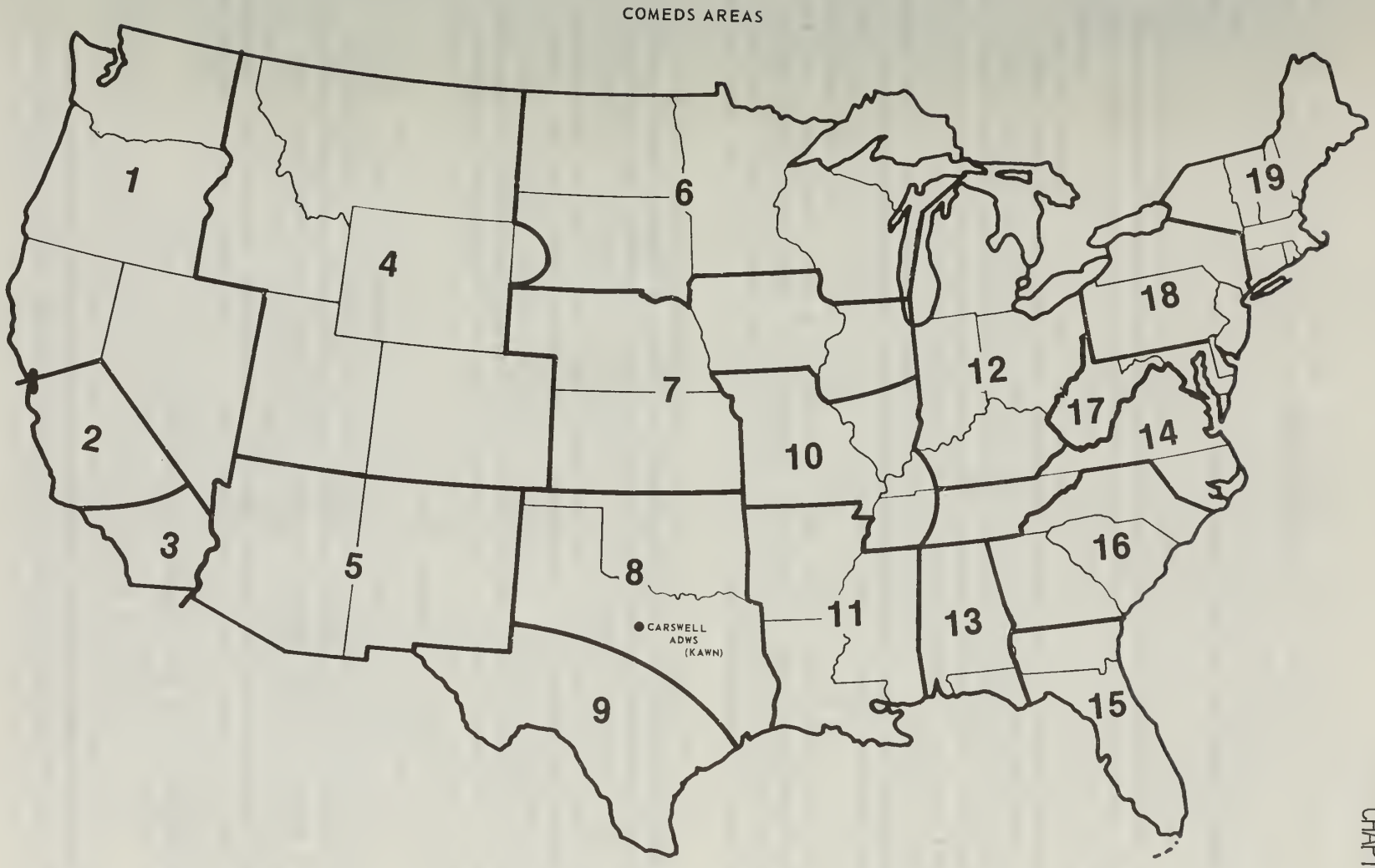


Figure 4-4.

USAF CONUS METEOROLOGICAL DATA SYSTEM (COMEDS)

CHAPTER 5

OBSERVATIONS

1. Radar Observing and Reporting Plans

a. Radar data, which are routinely used in the support of this Plan and in the preparation of National Severe Storms Forecast Center (NSSFC) and Air Force Global Weather Central (AFGWC) products, are available from radars of the U.S. Basic Weather Radar Network. This Network is composed of NWS radars, U.S. Air Force weather radars, and in the Western United States, air route traffic control radars. The air route traffic control radars are remoted into the Air Route Traffic Control Centers (ARTCCs) at Salt Lake City, Utah; Palmdale, Calif.; Albuquerque, N. Mex.; and Auburn, Wash. NWS local warning radars supplement the network radars. National Weather Service personnel at Palmdale, Albuquerque, and Auburn develop a composite of the radar data from radars remoted into these sites and transmit the data on an interagency (Atomic Energy Commission and National Weather Service) facsimile circuit to the National Weather Service Radar Unit at the Salt Lake City ARTCC. These data are then collated with the Salt Lake City radar data, and, by means of a data-telephone link, the final composite is sent to the Radar Analysis and Development Unit (RADU) at Kansas City for use in the Radar Summary Chart, and to AFGWC for use in meeting AWS requirements.

(1) National Weather Service radar observations, other than those from these four ARTCCs, are transmitted hourly on the Radar Report and Warning Coordination (RAWARC) circuits at H + 35 in RAREP (Radar Report) code. More frequent observations are taken and transmitted on RAWARC in severe weather situations. Hourly composites from ARTCCs are transmitted to a number of offices in the western intermountain region on the interagency facsimile circuit. Each ARTCC Radar Unit prepares a narrative summary of its composite and transmits the summary on RAWARC. These summaries and selected hourly radar observations are transmitted hourly on selected Service A circuits by the Modernized Weather Teleprinter Communications System (MWTCS) in Kansas City.

(2) At H + 35, radar reports in the RAREP code from the Air Weather Service (AWS) radar stations assigned to the U.S. Basic Weather Radar Network are forwarded to AFGWC from the Carswell Automated Digital Weather Switch (CADWS) by means of the data link. The NSSFC receives routine military radar weather observations from the CADWS through the FAA Weather Message Switching Center (WMSC). Severe military RAREPs (those describing tornadoes, severe thunderstorms, or hail observations and carrying the bulletin heading WOUS) are obtained by dual means; (1) a drop on the COMEDS; and (2) through the FAA WMSC.

(3) The National Weather Service, Air Force, and Navy operate a number of non-network radar facilities. Used primarily for local forecasting and warning and for immediate service to local agencies, these radars also provide selected information on severe storms. For example,

all USAF radar facilities in the conterminous United States, whether or not they are assigned Network responsibilities, report radar-detected hailstorms, severe thunderstorms, and tornadoes both on COMEDS communications and by telephone to the nearest Weather Service Office (WSO) of the National Weather Service, when so requested. Furthermore, all U.S. Air Force storm detection radar facilities, whether on the network or not, transmit hourly RAREPS and necessary specials whenever their station is covered by a Military Weather Advisory area or point warning calling for tornadoes or severe thunderstorms, unless they are within 30nm of a network reporting station.

b. A number of Aerospace Defense Command (ADC) radar sites are capable of limited detection and interpretation of weather echoes. Appendix 1 lists the six AWS units supporting the six ADC air divisions (ADs) with a map of radar site locations. Operational commitments permitting, these sites can provide limited supplementary data upon request. Contact should be made by calling the appropriate AD weather station. In general, either AFGWC or the supervising forecaster of the Severe Local Storms (SELS) Unit or RADU should attempt to contact a particular site through its associated AD weather station.

c. Whenever radar data from stations of the U.S. Basic Weather Radar Network are missing or appear to be in error, the military agencies and the National Weather Service have authorized the following:

(1) The RADU will telephone the military station and AFGWC will telephone (if necessary) the WSO for the missing data or clarification. Because RADU does not have the capability for obtaining such data through the COMEDS, the telephone must be utilized. In most cases where radar data from a WSO are missing or in error, RADU will usually obtain corrected data from that Office by means of RAWARC. Clarification of missing data will usually be available to AFGWC through this means. If such data are not forthcoming after a reasonable wait, AFGWC should contact the Radar Unit at the WSO by telephone.

(2) Air Weather Service (AWS) radar stations assigned to the U.S. Basic Weather Radar Network transmit radar observations hourly on the Continental U.S. (CONUS) Meteorological Data System (COMEDS) at H + 35 in RAREP (Radar Report) code. Carswell Automated Digital weather Switch (CADWS) forwards the data collected on the COMEDS to AFGWC by data link. The NSSFC receives routine military RAREP from the CADWS through the FAA Weather Message Switching Center (WMSC). Severe military RAREPs (those carrying the Bulletin heading WOUS) are obtained from both the COMEDS and the FAA WMSC.

(3) If Federal Telecommunications System (FTS) or Department of Defense (DOD) telephone lines are not available, commercial telephone shall be used.

d. If a WSO needs radar data from a nearby military radar (Network, ADC, or local use), such data can be obtained by local arrangements between the National Weather Service Meteorologist-in-Charge/Official-in-Charge and the

AWS Detachment Commander or the NAVWEASERV Commander/ Officer-in-Charge of the activity operating the radar facility. Authorizations for such arrangements have been completed between the National Weather Service and the military agencies in prior agreements. These data will be supplied on a noninterference basis and should usually be limited to severe weather situations.

2. Rawinsonde-Observing Stations

a. Rawinsonde observations are scheduled twice daily, 0000Z and 1200Z, at the 71 stations in the National Weather Service and Military Upper Air Network. These stations also take special observations whenever required and requested by the agency concerned.

Transponder capability is available at 33 stations to permit more accurate measurement of upper winds under strong wind conditions. Evaluated data from the routine soundings are transmitted over the Service C and COMEDS teletypewriter systems in the radiosonde code. Data from special soundings requested for potential or existing severe weather situations are transmitted by means of RAWARC and other appropriate communications circuits to NSSFC and AFGWC. Special soundings transmitted on RAWARC will use the standard upper air message heading to assure their relay to AFGWC.

b. Low-level soundings in support of the Air Pollution Control Meteorological Services program are taken at 6 stations. On weekdays all of these stations take routine observations to 700 millibars near sunrise, while only a few take observations around noon. During critical air pollution situations, observations are taken at 3 additional stations that operate on an on-call basis. Also, during these critical situations all stations would take observations 7 days a week. Data for the sounding taken near sunrise in the eastern half of the United States are transmitted on the Service C circuit at 1424Z and relayed, as necessary, to NSSFC and AFGWC. Data for the other soundings are transmitted on an unscheduled basis.

The DOD takes unscheduled observations at a number of schools, at mobile locations, and at research, development, test, and evaluation facilities. However, because of the irregular scheduling of these observations, the military agencies concerned do not deem it advisable to include all of the observations in this Plan. Non-network upper air stations which might be sources of data are given in table 5-1.

During the months of April, May, and June when the National Severe Storms Laboratory (NSSL) at Norman, Okla., and other agencies are usually engaged in an intensive severe local storms data collection program in central Oklahoma, upper air soundings are taken at a number of locations in support of this program. However, these data are processed by computer and are not available for real-time use.

TABLE 5-1. Non-Network Upper Air Stations Which Might be Sources of Data

STATION	OPERATED BY	TIME OF OBSERVATIONS	DISTRIBUTION	AGENCY CONTACT	WILL TAKE REQUESTED SPECIALS
Fort Bragg, NC.	USA	Unscheduled	COMEDS	Commander, Det. 3, 5th Wea. Sq.; AUTOVON 236-3914 ask for Weather Facility	No
Fort Benning, GA.	USA	Unscheduled	COMEDS	Commander, Det. 10, 16th Wea. Sq.; AUTOVON 835-7313, ask for Weather Facility	No
Fort Sill, OK.	USA	Unscheduled	COMEDS	Commander, Det. 11, 16th Wea. Sq.; AUTOVON 639-3200, ask for Weather Facility	No
Fort Hood, TX.	USA	Unscheduled	COMEDS	Commander, Det. 14, 5th Wea. Sq.; AUTOVON 737-9818 ask for Weather Facility	No
Fort Carson, CO.	USA	Unscheduled	COMEDS	Commander, Det. 58, 5th Wea. Sq.; AUTOVON 691-3651 ask for Weather Facility	NO
Edwards AFB, CA.	USAF	Unscheduled	COMEDS	Commander, Det. 21, 2nd Wea. Sq. AUTOVON 350-4318	No

TABLE 5-1. Non-Network Upper Air Stations Which Might be Sources of Data (Cont'd)

STATION	OPERATED BY	TIME OF OBSERVATIONS	DISTRIBUTION	AGENCY CONTACT	WILL TAKE REQUESTED SPECIALS
Eglin AFB, FL.	USAF	Daily 0300Z and 1500Z	COMEDS	Commander, Det. 10, 2nd Wea. Sq. AUTOVON 872-5710	Yes
White Sands Missile Range, NM.	USA	Unscheduled	COMEDS	CO, Met. Team, USA Electronics Command; AUTOVON 258-2537, ask for Met. Team	No
Marshall Space Flight Center, Huntsville, AL.	NASA	Unscheduled, dependent upon operations	Local loop to WSO Huntsville, Ala. then to RAWARC.	Bob Turner, FTS 453-3109	Yes
Navy Pacific Missile Test Center, San Nicolas Island, CA.	USN	Monday-Friday, 0000Z and 1800Z	Routinely on Service C	Tom Carr, commercial 805-982-7173 or 8508; AUTOVON 8-873-1750 or 7173 or 8508.	No
Navy Pacific Missile Test Center, Point Mugu, CA.	USN	Daily, 1200Z. Unscheduled frequent soundings during missions.	None	Same as above.	No. Will furnish unscheduled or 1200Z upon request.
Naval Air Technical Training Center, Lakehurst, NJ.	USN	Unscheduled	None	Supt. of AG Schools; commercial 201-323-2228; AUTOVON 8-624-2228	Yes

3. Surface Weather Observational Network. To provide the basic weather data needed for the analyses performed by the National Meteorological Center (NMC), NSSFC, and AFGWC, all available surface data are used. The following stations provide data:

a. The WSOs/WSFOs and Automatic Meteorological Observing Stations (AMOS).

b. The Federal Aviation Administration (FAA) weather-reporting stations--Flight Service Stations (FSS) and Towers.

c. Supplementary Aviation Weather Reporting Stations (SAWRS), including part-time paid, cooperative aviation and synoptic weather-reporting stations, and the U.S. Coast Guard facilities.

d. The DOD weather-reporting stations.

These stations take observations and transmit coded observational data at regularly scheduled intervals. Transmissions are made hourly and even more frequently for aviation purposes, every 3 and 6 hours for synoptic map preparation, and daily for climatological purposes.

4. Pilot Reports (PIREPS).

a. The present FAA Instrument Flight Rules (IFR) regulation (91.125, radio communications, section b.) requires pilots to report "(b) Any unforecast weather conditions encountered; and...".

b. Pilots should report any weather condition they encounter which is hazardous to aviation.

c. The ARTCCs are requested to pass PIREPS to FSSs which are required to place them on the Service A teletypewriter circuit for distribution.

5. Severe Storm Surveillance by Meteorological Satellites: Several types of data are available from the various operating meteorological satellites during the severe local storms season. (Table 5-2 summarizes the operational satellites and data available.)

a. NOAA Polar Orbiting Satellites. These satellites cross the U.S. twice daily at about 9:00 a.m. and 9:00 p.m. Twice-daily soundings taken from Vertical Temperature Profile Radiometer (VTPR) observations are used in NMC analyses and forecasts and are distributed also via teletype on an orbit-by-orbit basis. High resolution (1 km) pictures in the visible and infrared from the Very High Resolution Radiometer (VHRR) covering the U.S. are available via direct readout. VHRR sectors for the U.S. can be made available to Satellite Field Service Stations (SFSSs) and WSFOs within 30 to 60 minutes after observation if the need exists.

b. Geostationary Operational Environmental Satellite (GOES). The current GOES system consists of GOES-1 at 75°W, SMS-2 (Synchronous Meteorological Satellite) at 135°W, and SMS-1 in standby at 105°W. The main products are pictures taken at frequent intervals, day and night. During routine operations a picture is taken and disseminated every 30 minutes. On storm days, pictures are taken at 15-minute intervals. (NOTE: Under routine circumstances, each satellite is taken out of service for a 2 1/2-hour period every other night while preventive maintenance is performed on the ground equipment. This maintenance is scheduled on GOES-1 from 0450-0720 GMT and on SMS-2 from 0505-0735 GMT. If the severity of the weather situation warrants, preventive maintenance can be deferred or rescheduled to assure continuous satellite coverage until the activity has subsided.

During daylight hours, standard visible picture sectors of 1, 2 and 4 km resolution are produced routinely. During nighttime, equivalent 2 and 4-km resolution standard sectors are produced from the IR data. Also, sectors of enhanced IR can be produced day or night to emphasize certain weather features, such as highest tops in a convective cloud system. Heights of cloud tops are computed by the NESS Analysis and Evaluation Branch (AEB). This information is available four times daily at 0015 GMT plus every six hours, and can be accessed and displayed on the KCRT system at Kansas City and elsewhere. All standard sectors are gridded automatically before they are disseminated. These standard products are delivered in real time to the NESS AEB and to WSFOs through the SFSSs. In addition to the standard sectors, each SFSS has two floating sectors which it may center over the area(s) of significant weather and keep these areas under surveillance as they move and develop. AFGWC has a port at the Kansas City SFSS by which AFGWC receives GOES imagery (common to MKC/SFSS).

(1) Satellite Field Services Stations (SFSSs). As seen in Figure 5-1, GOES picture sectors are distributed from the NESS Central Data Distribution Facility at the World Weather Building in Camp Springs, Md., to SFSSs at Kansas City, Miami, San Francisco, Washington, and Honolulu. The SFSS in Kansas City is collocated with the NSSFC; the SFSS in Miami is collocated with both the NHC and the Miami WSFO. All other SFSSs are collocated with WSFOs. The SFSSs help WSFOs interpret and use the satellite pictures. In addition to GOES picture sectors, selected VHRR pictures can be distributed through the GOES system in near real time when the need exists.

The SFSS in Kansas City supports NSSFC plus all WSFOs in the central U.S. from Canada to the Gulf of Mexico. This SFSS continuously produces, analyzes, monitors, and disseminates GOES products to the stations it supports. It also advises NSSFC and affected WSFOs of areas where the satellite pictures show severe weather in progress or indicate the possibility of severe development. This SFSS operates 7 days a week, 24 hours a day--telephone (FTS) 758-2102.

SATELLITE	TYPE OF DATA	LOCAL TIME	NESS PRODUCTS	METHODS OF DISTRIBUTION
ITOS (NOAA Series)	SR (stored) VTPR VHRR	0900, 2100	1. Cloud cover imagery 2. Sea-surface temp. analysis 3. Moisture analyses 4. Temperature soundings	. Limited facsimile, teletype . Direct GOES picture lines from the CDDF to SFSSs and WSFOs
GOES-1 (East) SMS-2 (West)	VISSR	Every 30 min. (Limited scan for short interval viewing available)	1. 8 Km Resolution IR (Full Disk) 2. 4 Km Resolution VIS Sectors 3. 2 Km Resolution VIS Sectors 4. 1 Km Resolution VIS Sectors 5. Equivalent IR Sectors (8 Km Resolution, with equivalent 2 Km sector geographical coverage). 6. Enhanced IR data 7. Cloud top heights	
DMSP	HR/LS VHR/LF IR/TS WHR/TF	Early morning/evening Noon/midnight	AFGWC PRODUCTS 1. 3 hourly 3-dimensional Nephanalysis 2. Mapped HR and IR displays 3. Real time VHR and WHR Displays	. By telephone conference with Severe Weather Specialist in AFGWC . Selected photos supplied by mail for post mortem analysis

CDDF - Central Data Distribution Facility
GOES - Geostationary Operational Environmental Satellite
ITOS - Improved TIROS Operational Satellite
SMS - Synchronous Meteorological Satellite
DMSP - Defense Meteorological Satellite Program

VHRR - Very High Resolution Radiometer
VISSR - Visible Infrared Spin-Scan Radiometer
VTPR - Vertical Temperature Profile Radiometer
HR/LS - High Resolution/Light Smooth Video Data (1.5-2.0 nm)
VHR/LF - Very High Resolution/Light Fine Video Data (1/3 nm)
IR/TS - Infrared/Thermal Smooth Data (1.5 - 2.0 nm)
WHR/TF - Very High Resolution Infrared/Thermal Fine Data (1/3 nm)

Table 5-2.

SATELLITE AND SATELLITE DATA AVAILABILITY FOR 1977 SEVERE LOCAL STORMS SEASON

c. DOD Defense Meteorological Satellite Program (DMSP): This is a DOD managed system to collect and process meteorological data from space-borne sensors. These data are processed by the AFGWC and are available for timely application to severe weather forecasting. DMSP data is currently archived by NOAA/NESS at the University of Wisconsin and is available for use in severe weather research and development.

6. Severe Local Storm Actions of Nonmeteorological Agencies and Individuals. The National Weather Service uses observations of severe local storms, particularly tornadoes, from many nonmeteorological agencies and personnel such as: utility companies, State Highway Patrols, local police departments, road maintenance patrols, citizen spotters (network), cooperative National Weather Service climatological observers, Citizen Band radio groups, local Civil Defense Organizations, radio and television station mobile units, city employees (for example, the Chicago Sanitary District), the FAA, and individual citizens.

Reports are received by various means--which are not uniform at each WSO--including Citizen Band or Civil Defense radio facilities (with a transceiver often located in the WSO and manned by local cooperators), police radio, direct telephone lines involving unlisted numbers, the National Warning System (NAWAS), State Highway Patrols, teletypewriter circuits by means of telephone or a sending "drop" on statewide NOAA Weather Wire Service (NWWS) circuits, and Service A teletypewriter circuits.

Reports are disseminated to mass news disseminators, to other WSOs, and to safety agencies by NWWS circuits (first priority, except for a more expedient means in some local areas), RAWARC, NAWAS, telephones (hotlines and commercial), NOAA Weather Radio, direct commercial radio broadcasts, telephone recordings, and Civil Defense radio facilities. The "fan-out" principle is utilized wherever practical.

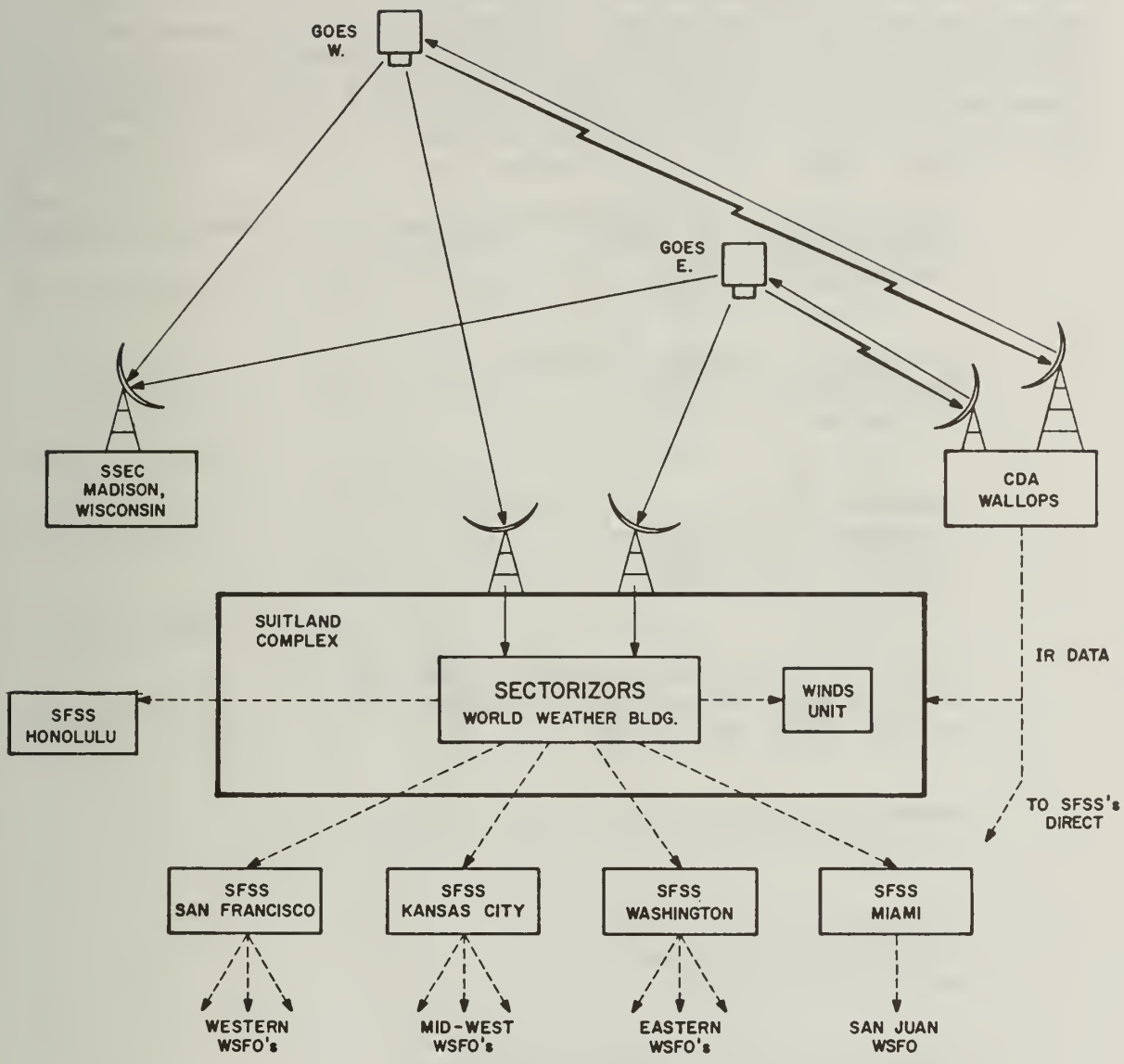


Figure 5-1.

GOES Operational Data Flow

CHAPTER 6

PUBLICITY

The Military Weather Advisories and Point Warnings of the Air Force Global Weather Central (AFGWC) are designed for specialized military users and shall not be released to the public. News media releases that concern the cooperative efforts in severe storms activities of the Department of Defense and NOAA weather services and of other agencies should reflect the joint nature of these efforts by giving due credit to participating agencies. Copies of these releases should be forwarded to:

Deputy Director for Operations/Environmental Services
The Joint Chiefs of Staff
Washington, DC. 20301

Assistant for Weather, USAF/PRW
United States Air Force
Washington, DC. 20330

Assistant Chief of Staff for Intelligence
Department of the Army
Attention: DAMI-DOT-C
Washington, DC. 20310

Director, Naval Oceanography and Meteorology
National Space Technology Laboratories
Bay St. Louis, MS. 39520

Headquarters, Air Weather Service (AWS/CS)
Scott Air Force Base, IL. 62225

NOAA Public Affairs Office
6010 Executive Boulevard
Rockville, MD. 20852

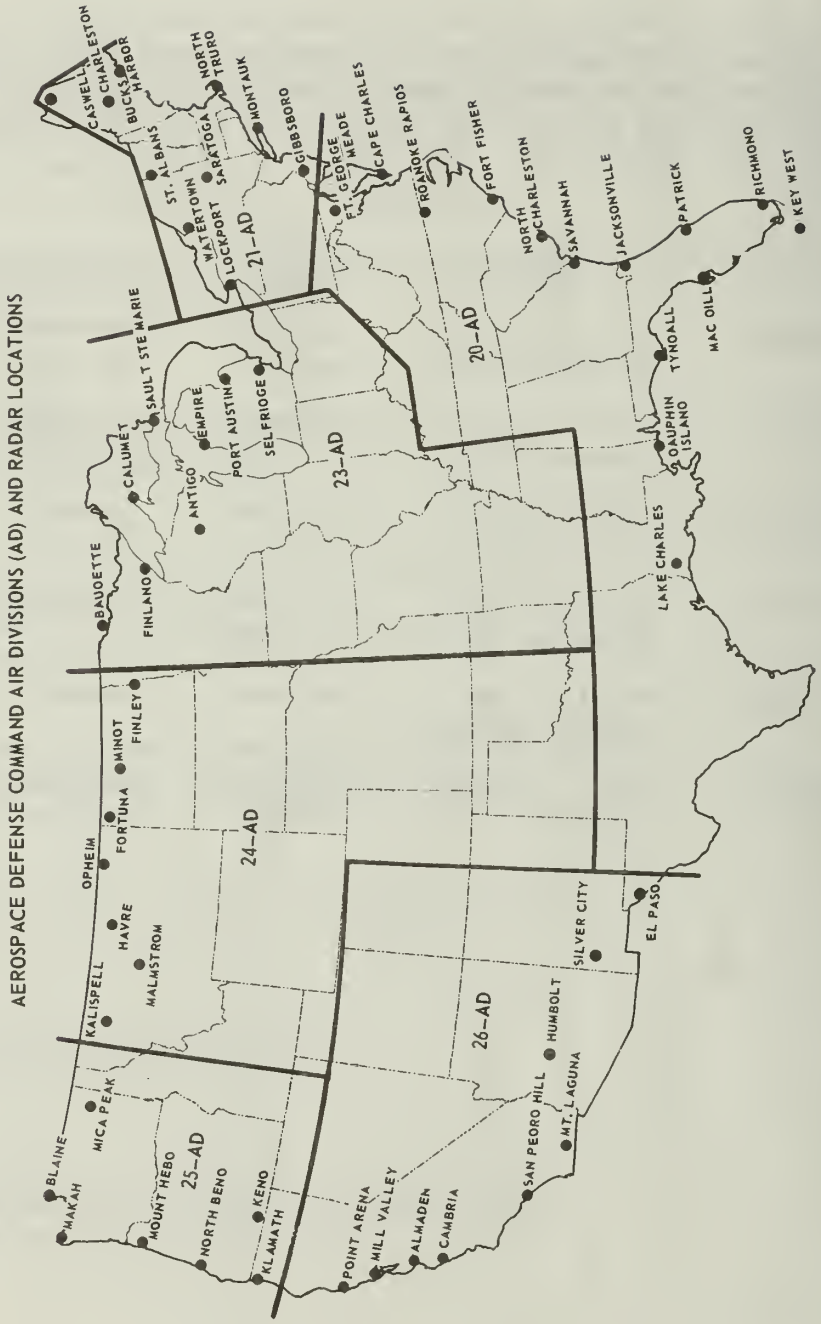
Commandant, United States Marine Corps
Headquarters, United States Marine Corps
Washington, DC. 20380

AEROSPACE DEFENSE COMMAND (ADCOM)
WEATHER STATIONS AND AREAS OF RESPONSIBILITY

The following AWS units supporting ADC air divisions can obtain appropriate operational permission and contact radar sites within the division area of responsibility. See attached map for division areas and location of radar sites.

Air Division (General Area of Responsibility)	AWS Unit	Autovon Number	FTS Number
20 AD (Southeast)	Det 41, 12 WS Ft Lee AFS VA	687-4008 Ext 765	732-7256 Ext 765
21 AD (Northeast)	Det 27, 12 WS Hancock FLD NY	587-9535	458-5500 Ext 535
23 AD (N Central)	Det 8, 12 WS Duluth IAP MN	825-8765	727-8211 Ext 765
24 AD (N Plains)	Det 3, 12 WS Malmstrom AFB MT	632-3154 Ext 6765	731-3154
25 AD (Northwest)	Det 11, 7 WW McChord AFB WA	976-6766	984-6766
26 AD (Southwest)	Det 11, 12 WS Luke AFB AZ	853-2611 Ext 765	935-2611 Ext 765

APPENDIX 1



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